

Appl. No. 10/045,948
Amdt. dated June 28, 2003
Reply to Office action of March 28, 2003
Remarks/Arguments

In the specification, the applicant has clarified the printing error at the top of page 7. The applicant has further amended the paragraph to reference co-pending US Patent Application Ser. No.10/045,930, and entitled "HYDROETCHING OF HIGH SURFACE AREA CERAMICS USING MOIST SUPERCRITICAL FLUIDS", filed October 26, 2001. No new matter is added by this amendment.

35 U.S.C § 102(b)

The examiner has rejected claims 1-9 under 35 U.S.C § 102(b) as being anticipated by Läufer et al., US Patent 3,920,865, noting in particular examples 1-3 and column 4, lines 59-64. The examiner concedes that Läufer et al. don't explicitly recite that the organopolysiloxane provides a "monolayer" coating on the silica or other aerogel, but posits that such a coating can be "inferred" from column 4, lines 53-58 because the patentees disclose a chemical reaction of the hydrophobizing agent only with the active surface of the oxide particles. The examiner has done an admirable job in locating this prior art, and the applicant recognizes that the examiner is entitled to set forth this inference. However, the inference does not stand up to the reality of the chemical reactions that actually take place, and the applicant is entitled to present evidence to rebut the examiner's inference.

To bond with the substrate, the cyclic octamethyltetrasiloxane used in Läufer's examples must undergo an opening of the cyclic chains, which in turn will produce a ring opening polymerization catalyst, resulting in a living polymer. The resultant polymerization that will therefore not be limited to the surface of the substrate and will therefore not form a monolayer, as is required in claims 1-9. In support of the applicant's rebuttal, the applicant has submitted herewith the affidavit of Dr. William D. Samuels under Rule 132. Dr. Samuels' affidavit clearly establishes the arguments set forth above, and provides sufficient evidence to overcome the inference relied upon by the Examiner. In addition, the polymeric behavior of the materials disclosed by Läufer et al., which prevents them from forming the monolayer required in claims 1-9, have been studied in

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refereed scientific publications. Examples of such publications include the following,

which is by no means an exhaustive listing, and which are also referenced in Dr. Samuels affidavit:

Synthesis of Polymethyl(trimethylsiloxy)siloxane by Anionic Ring-Opening

Polymerization of 1,3,5-Trimethyl-1,3,5-tris(trimethylsiloxy)cyclotrisiloxane

Cai, G. P.; Weber, W. P.; Macromolecules; (Article); 2000; 33(17); 6310-6314.

Microstructure of the Copolymer Chain Generated by Anionic Ring-Opening

Polymerization of a Model Cyclotrisiloxane with Mixed Siloxane Units1 Cypriak, M.;

Kazmierski, K.; Fortuniak, W.; Chojnowski, J.; Macromolecules; (Article); 2000; 33(5);

1536-1545.

Preparation and Orthogonal Polymerizations of 1-Hydrido-1-vinyldimethylsiloxy-3,3,5,5-

tetramethylcyclotrisiloxane Paulasaari, J. K.; Weber, W. P.; Macromolecules; (Article);

1999; 32(16); 5217-5221.

1,1,3,3,5,5,7,7-Octaphenyl-1,3,5,7-tetrasiloxane-1,7-diol and Its Organotin Derivatives.

Model Compounds for Diphenylsiloxane Polymer Beckmann, J.; Jurkschat, K.; Muller,

D.; Rabe, S.; Schurmann, M.; Organometallics; (Article); 1999; 18(12); 2326-2330.

Silica-Dimethylsiloxane Hybrids-Non-Hydrolytic Sol-Gel Synthesis and Characterization

by NMR Spectroscopy Apperley, D.; Hay, J. N.; Raval, H. M.; Chem. Mater.; (Article);

2002; 14(3); 983-988.

Synthesis of Organic-Inorganic Hybrids via the Non-hydrolytic Sol-Gel Process

Hay, J. N.; Raval, H. M.; Chem. Mater.; (Review); 2001; 13(10); 3396-3403.

Taken together with Dr. Samuels' affidavit, these references establish beyond any shadow of a doubt that the inference relied upon by the Examiner is overcome, and the

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applicant therefore respectfully requests that the examiner remove his rejection of claims 1-9 under 35 U.S.C § 102(b) as being anticipated by Läufer et al., US Patent 3,920,865.

35 U.S.C § 103(a)

The examiner has rejected claims 1-9 under 35 U.S.C § 103(a) as being unpatentable over Läufer et al., US Patent 3,920,865 in view of Wirth et al., US Patent 5,716,705. The examiner argues that even if Läufer et al. do not form a monolayer coating, Wirth et al. do, and therefore it would have been obvious to apply the method taught by Wirth et al. to the aerogel substrates discussed in Läufer et al. Again, the examiner has done an admirable job in locating the Wirth et al. reference, and the examiner's combination of Wirth et al. with Läufer et al. for purposes of constructing a prima facie case of obviousness is, on its face, proper. Unfortunately, the chemical reality of such a combination will not produce the aerogel having a monolayer coating claimed in claims 1-9. The reason it will not is because the method(s) employed by Läufer et al. and Wirth et al. direct the monomers to the substrate in liquid and gas form. See column 1, lines 12-16 and the abstract of Läufer et al.; see column 6, lines 23-36 and the paragraph bridging column 6 and 7. As described in the background section of the specification, page 2, line 4 through page 3, line 2, the structures of aerogels do not withstand the capillary forces of water, and the random structure of aerogels, with the attendant constrictions and/or blockages, together with the lack of any solvating properties, ensure that a gas phase approach will not accomplish mass transport of the monomer into the complex pore structure of the aerogel. While Läufer et al. may partially overcome the limitations inherent in the constrictions and/or blockages, (which is by no means certain) as described above, Läufer et al. does so with a living polymer mechanism, such as the ring opening polymerization catalyst, insuring that even if these difficulties are overcome, the result is not a monolayer, but rather several layers of polymer. With respect to the use of liquids, as taught in the applicant's specification, and further evidenced by the affidavit of William D. Samuels, such techniques simply will not work, as the structure of the aerogels cannot withstand the forces inherent in the liquids. Accordingly, it is not surprising that Läufer et al. do not attempt to coat aerogels in liquid media.

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Wirth et al. don't coat aerogels, thus they are free to use liquid media, and in fact the examples set forth in Wirth et al. use liquid media exclusively. In the final analysis, neither Wirth et al. or L  ufer et al. remotely teach or suggest the use of supercritical fluids, as is taught and claimed in the present application, and which is the only method which would actually form the monolayer coating on an aerogel, as claimed in claims 1-9. Thus, the combination of L  ufer et al. and Wirth et al., even if proper, does not and cannot form a prima facie case of obviousness under 35 U.S.C    103(a) because it would not result in the claimed structure as a matter of chemical and physical principles. The applicant therefore respectfully requests that the examiner remove his rejection of claims 1-9 under 35 U.S.C    103(a) as being unpatentable over L  ufer et al., US Patent 3,920,865 in view of Wirth et al., US Patent 5,716,705.

Double Patenting

The examiner has rejected claims 1-9 and 11-20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of US Patent 6,531,224. The applicant has filed a terminal disclaimer herewith, as suggested by the examiner, thereby rendering rejection on this basis moot.

35 U.S.C    112 first paragraph

The examiner has rejected claims 21-25 under 35 U.S.C    112 first paragraph as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The examiner has indicated that this ground of rejection will be reconsidered when the applicants furnish the serial number and filing date of the copending application referred to on page 6 of the specification. The applicant has amended page 6 of the specification to provide the serial number and filing date of the copending application, and trusts that the examiner will find that the disclosure contained therein meets with the requirements of 35 U.S.C    112 first paragraph.

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Claim 10

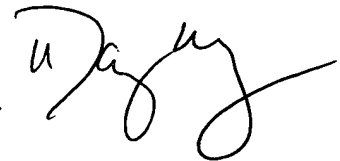
The applicant notes the examiner's indication of claim 10 as allowable subject matter, and express their appreciation.

Closure

Applicant has made an earnest attempt to place the above referenced application in condition for allowance and action toward that end is respectfully requested. Should the examiner have any further observations or comments, he is invited to contact the undersigned for resolution.

Respectfully submitted,

Douglas E. McKinley, Jr.
Reg. No. 40,280

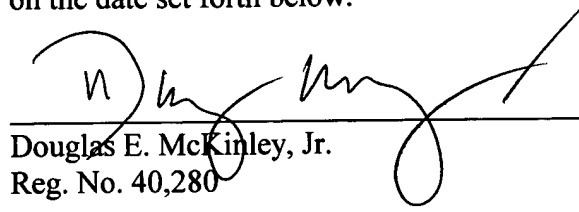


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The undersigned hereby certifies that the forgoing Amendment dated June 28, 2003 in reply to the office action of March 28, 2003, Rule 131 Affidavit of Dr. William D. Samuels (15 pages), PTO Form PTO/SB/26 (terminal disclaimer, 1 page), PTO Form PTO/SB/96 (statement under 27 CFR 3.73(b), 1 page) PTO Form PTO/SB/17 (fee sheet, 1 page, two copies), and return postcard are being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

on the date set forth below.



Douglas E. McKinley, Jr.
Reg. No. 40,280

June 30, 2003
Date